MINUTES
of the
THIRD MEETING
of the
WATER AND NATURAL RESOURCES COMMITTEE

August 29-30, 2013
San Juan College, Farmington

The third meeting of the Water and Natural Resources Committee was called to order on August 29, 2013 at 9:10 a.m. by Senator Phil A. Griego, chair, in the Henderson Fine Arts Center at San Juan College in Farmington.

Present
Sen. Phil A. Griego, Chair
Rep. Phillip M. Archuleta
Rep. Paul C. Bandy
Sen. Joseph Cervantes
Rep. Brian F. Egolf, Jr.
Rep. Larry A. Larrañaga
Sen. Cliff R. Pirtle
Sen. Sander Rue
Rep. Mimi Stewart
Rep. James R.J. Strickler
Rep. Don L. Tripp
Sen. Peter Wirth
Sen. Pat Woods

Absent
Rep. George Dodge, Jr., Vice Chair
Rep. William "Bill" J. Gray
Rep. Dona G. Irwin
Rep. Emily Kane
Sen. George K. Munoz
Sen. Benny Shendo, Jr.

Advisory Members
Sen. Carlos R. Cisneros
Rep. Sharon Clahchischilliage
Sen. Lee S. Cotter
Rep. Anna M. Crook
Sen. Ron Griggs
Rep. James Roger Madalena (August 30)
Sen. Cisco McSorley
Sen. Steven P. Neville
Sen. Mary Kay Papen
Rep. Tomás E. Salazar
Sen. William E. Sharer
Rep. Bob Wooley

Rep. Cathrynn N. Brown
Sen. Pete Campos
Rep. Gail Chasey
Rep. Nora Espinoza
Rep. Candy Spence Ezzell
Sen. Stuart Ingle
Sen. Gay G. Kernan
Rep. Rodolpho "Rudy" S. Martinez
Rep. W. Ken Martinez
Sen. Gerald Ortiz y Pino
Sen. Nancy Rodriguez
Sen. John C. Ryan
Rep. Henry Kiki Saavedra
Sen. John Arthur Smith
Rep. Jeff Steinborn

Guest Legislators
Rep. Debbie A. Rodella (August 29)
Rep. Thomas C. Taylor (August 29)

(Attendance dates are noted for those members not present for the entire meeting.)

Staff
Jon Boller, Legislative Council Service (LCS)
Renée Gregorio, LCS
Jeret Fleetwood, LCS

Guests
The guest list is in the original meeting file.

Handouts
Handouts and other written testimony can be found in the meeting file or on the New Mexico Legislature's web site at www.nmlegis.gov.

Thursday, August 29

Introductions and Welcome
Senator Griego began the meeting by having members of the committee introduce themselves.

Representative Strickler invited members of the committee to tour the Hogback Irrigation Project, where a volunteer cleanup effort is under way.

Toni Pendergrass, president of San Juan College, thanked the committee for meeting in Farmington and provided the committee with some background and facts about the college. She said that about 18,000 students are enrolled at San Juan College, making it the fourth-largest college in New Mexico, and that the average age of a student at the college is 36, which is higher than the nationwide average of 28. Dr. Pendergrass also noted that many of the students at the college are first-generation college students and that many of the graduates from the school tend to stay in New Mexico. She also thanked the legislature for its support on a project for a new School of Energy building.

Hydraulic Fracturing (Fracking) and Water Use
Scott Verhines, state engineer, said that he is vice chair of the governor's New Mexico Drought Task Force and that a subcommittee of the task force has been looking at recoverable water, including brackish, gray and produced water. He said that the subcommittee is collecting data at this point.

Karin Foster of the Independent Petroleum Producers Association provided the committee with an overview of the hydraulic fracturing process. She began by explaining the basics of oil and gas wells, noting that while drinking water wells are relatively shallow, oil and gas wells are much deeper, and that 40% to 50% of the mineral is typically left in a traditional well. Ms. Foster said that fracturing has been in use for about 40 years and allows drillers to enhance well production, particularly in tight rock. She went on to say that the fracturing process involves injecting water and various other substances into wells to fracture rock and shale in order to release more mineral. Ms. Foster went over the technique, explaining that acidic fluid is injected first to clean the hole, followed by water and gels containing sand. She also addressed concerns over the makeup of fracturing fluid, explaining that the fluid is 99% water and sand, and that developers are required to disclose the makeup of fracturing fluid to the Oil Conservation Division (OCD) of the Energy, Minerals and Natural Resources Department. Ms. Foster also pointed out that most developers also disclose the makeup of their fluids to an online database called "Fracfocus", acknowledging that some substances are trade secrets and are not disclosed. As to the question of whether or not the process negatively affects ground water supplies, Ms. Foster read several statements saying there has not been ground water contamination due to hydraulic fracturing in the state.

Ms. Foster also discussed the amount of water used in hydraulic fracturing, explaining that different basins use different amounts of water, ranging from 45,000 gallons per well up to one million gallons per well. She said that while that amount may seem high, it is not when compared to other water uses in New Mexico, accounting for .25% of total water use in the state. Ms. Foster also said that water must be taken to and from well sites by truck, which is expensive. She also said that developers are trying to fracture with water containing higher amounts of total dissolved solids than are found in drinking water. Ms. Foster also discussed the development of multi-well field management pits to try to reduce the amount of water used in the fracturing process.

Bruce Baizel, energy program director for Earthworks, explained that fracturing, in addition to being an energy issue, is also a social and technical issue that is not going away. He discussed some of the lack of trust the public may have about fracturing, noting that a 2007 sampling program conducted by the OCD revealed that, in addition to water and sand, some toxins, including diesel fuel, were found in pit fluids. Mr. Baizel went on to say that most of the oil that was easy to extract is gone, prompting the industry to drill more and more wells in search of additional oil. Mr. Baizel also said that many oil and gas companies do not coordinate with the OCD and Fracfocus, citing disparities in reports filed with both.

Mr. Baizel addressed water quantity issues associated with fracturing, explaining that there are few reliable estimates as to the amount of water needed to drill and fracture the permitted number of wells in New Mexico or in specific river basins. He also pointed out that while the amount of water needed per fracture operation varies by region, even the minimum represents a significant amount of water. Mr. Baizel also discussed the various sources of water

contamination that can occur at oil wells, such as transportation, casing failure, leaks and disposal. He also noted the increasing number of closed-loop systems in use.

L. Greer Price, state geologist and director of the Bureau of Geology and Mineral Resources, explained that geologists are primarily interested in subsurface issues, as opposed to water use, but that currently studies are being conducted that will include data on water use and availability in the areas being studied.

Ron Broadhead of the New Mexico Institute of Mining and Technology (NMIMT) briefed the committee on the geology of oil and gas in the Mancos shale within the San Juan Basin. He began by showing the committee the various subsurface geologic layers and their depth, as well as the location of various oil and gas reservoirs in the northwestern corner of New Mexico. Mr. Broadhead also showed the committee the depth of various oil- and gas-producing sites within the layer of Mancos shale in the San Juan Basin. He also provided the committee with a photograph of a core sample taken from a fracturing site, explaining that wells in the area do not appear to be as productive as they once were. Mr. Broadhead also said that horizontal drilling, a component of the fracturing process, multiplies the surface area reachable by a single vertical well, so that one horizontal well replaces the need for multiple vertical ones.

Shari Kelly, also of NMIMT, reported on a study NMIMT has begun in conjunction with the Farmington office of the federal Bureau of Land Management to determine the potential subsurface development of the Gallup/Mancos formation to estimate the associated surface impact of the development in terms of wells drilled and expanded infrastructure. She noted that one of the components of the study is a hydrologic assessment of the water supply for the San Juan Basin, which would summarize the existing water rights held in the basin and categorize them by use, as well as tabulate the amount of water used in drilling horizontal and vertical wells. Dr. Kelly said that, in conducting the hydrologic study — the first such study in 20 years — Office of the State Engineer (OSE) information on water rights had been gathered and that well operators and other key players in the region have been interviewed. She said that coal and uranium mines are the biggest water users in the area and that the 11 aquifers in the area are currently being mapped. Dr. Kelly went on to explain that other tasks for the study include data compilation, development of information regarding wells, contours and geologic contacts and volume calculations. She said that volume calculation estimates the volume of fluids in pore space and the amount of fluid retrievable, which varies based on mixtures of rock and their porosity. Dr. Kelly said that not all of the water in the pore space can be extracted.

Questions and comments from the committee included the following:

- the type of sand used to hold fractures open depends on the geologic formation and water;
- some ground water contamination did occur before the new pit rule was instituted, mostly from legacy pits, but not much data have been collected since the pit rule was adopted;

- the amount of water used in fracturing varies greatly, as different operators, techniques and types of formations require different amounts of waters;
- Fracfocus reporting is voluntary, and the numbers listed come from reports of operators;
- the industry is trying to develop better means of reusing water from drilling, as current technology only allows for 10% to 15% of the water to be reused in the San Juan Basin;
- power generation uses water to cool towers while surface mining uses it to control dust;
- oil and gas exploration in the region reached a peak in about 2006-2007 and seems to have tapered off since then;
- while fracturing has been going on for some time, it has changed as new types of wells and more horizontal wells are used;
- the disparity between Fracfocus and OCD records;
- a well would have to have been drilled after April 1, 2012 to be subject to reporting requirements, but since not many new wells have been drilled in the region, very little data are available;
- all of the material in fracturing fluid must be disclosed in Texas and Pennsylvania, but not in New Mexico;
- operators cannot disclose trade secrets owned by the manufacturer of fracturing fluid, as trade secrets are protected by state law;
- ground water contamination legislation in Wyoming, Colorado and Texas;
- ground water baseline testing in Colorado;
- fresh water is expensive to use for fracturing, so produced water that has been "cleaned" is beginning to be used;
- produced water is generally removed from a well site by truck, although some pipelines have been used, and taken to a class two injection well or a saturation disposal site;
- the revised pit rule allows for multi-well water management;
- the OCD has jurisdiction over produced water, not the state engineer;
- the interim Revenue Stabilization and Tax Policy Committee received a report stating that 30% of total revenues for New Mexico come from oil and gas;
- wells today have shorter life spans, and that production needs to be replaced;
- oil and gas exploration is a boom or bust business;
- the oil and gas industry is interested in saving water resources, and as technology improves, less water is necessary;
- the distance sand is injected in fracturing varies, but 1,000 feet is a good distance;
- spacing between oil wells is different from gas wells, but horizontal drilling makes it more likely that one well will communicate with, and could impact, other wells;
- rules in New Mexico were written with vertical drilling in mind;
- there are studies that show fracturing can have some impact on ground water; and
- the use of nitrogen or liquid propane instead of water in some fractures.

Technology for Pre-Treatment of Water for Reuse

Bill McMillan of Breakwater Valve Systems, LLC, described the use of the Mitton Cavitation Reactor (MCR) to process and clean produced water. He explained that cavitation is basically the generation, growth and collapse of millions of cavities in water within a reactor, producing extremely high temperatures and pressures, which cleans produced water by stratifying water and various contaminants, and cleans 99% of total dissolved solids in produced water during the first five minute pass through a reactor. Mr. McMillan said that use of MCR technology could eliminate the need for chemical treatment of water going into salt water disposal wells and various other types of water cleaning technologies. He pointed out that the price of cleaning or disposing of produced water represents a significant cost to the oil and gas industry. Mr. McMillan also noted that Breakwater has configured its reactors to operate at a reduced pounds per square inch, greatly reducing the cost of annual maintenance to the reactors.

Questions and comments from the committee included the following:

- disposal of extracted material depends on what type of contaminants are being treated, as cavitation can change the molecular structure of some carcinogens so that there is no byproduct;
- oxygen and hydrogen molecules are injected into the MCR, where they bond with some pollutants to become benign compounds, while sand and some other pollutants sink to the bottom of the reactor space;
- testing shows the MCR process can remove most pollutants, and Breakwater is working on removing others, such as arsenic;
- the MCR process treated produced water to cleaner standards than are in place in Texas;
- the cost to treat water is very inexpensive, but the reactors themselves range from $100,000 to $1 million, while annual maintenance runs about $4,000;
- MCR removes total suspended solids and salts in solution; and
- reactor costs depend on the nature of contaminants and the volume of water to be treated.

School of Energy at San Juan College

Randy Pacheco, dean of the School of Energy at San Juan College, outlined the development of the School of Energy and its programs. He explained that the staff of the school could earn more in the oil and gas field, but that they have chosen to work in a field that offers its students a chance at a better life. Mr. Pacheco went on to note that energy consumption in the United States has shown moderate growth, but that there is steady increase in global demand. He went on to explain that the School of Energy focuses on producing graduates who are crucial to the oil and gas production industry, offering programs on compression technology, petroleum technology, renewable energy, instrument control technology and occupational safety. Mr. Pacheco also noted that the school has formed partnerships with the oil and gas industry, local power plants and state and local governments. He also said that the economic downturn in 2008 spurred an increase in enrollment, as the oil and gas industry remains a source of high-paying jobs. He pointed out that the school has the largest commercial driver's license program in the

state. Mr. Pacheco said that some of the challenges facing the School of Energy are the recruitment and referral of trainees and being able to respond to the needs of the oil and gas industry. He said that in the near future, the school will develop a program in low carbon emissions technology. He stressed that the programs at the school are for people in the field, such as field technicians, lease operators and compression technicians, and that very few programs are available for such jobs. Mr. Pacheco noted that the graduation rate in the School of Energy is over 90% and that graduates of the program have a 90% placement rate with energy companies.

Terms and Implementation of the Navajo Indian Water Rights Settlement

Estevan Lopez, director of the Interstate Stream Commission (ISC), began by giving a brief history of the Navajo Indian water rights settlement, explaining that negotiations began under Governor Gary Johnson's administration in the 1990s and concluded with the signed agreement in 2005 and congressional approval in 2009. He went on to say that the water rights in the settlement are mostly from existing, federally authorized projects and sharing agreements. Mr. Lopez explained that 326,000 acre-feet of depletions per year are allocated to the Navajo Nation and went on to address some of the concerns raised over the settlement. For example, Mr. Lopez noted that while critics of the settlement point out that the amount allocated to the Navajo Nation is several times the amount provided to the city of Albuquerque, they are comparing agricultural water use to municipal use, which is not a valid comparison. He also said that the settlement will actually make it more difficult for the Navajo Nation to sell and export its water rights. Mr. Lopez explained that the overall project is worth about $1 billion and represents certainty for water users while avoiding litigation and giving the OSE some jurisdiction over the Navajo Nation's use of water. He also said that the state's cost share of the project is about $50 million, and that while the state is within about $5 million of meeting that obligation, gross receipts taxes on the project construction will likely recover most, if not all, of the state's total share of the project cost. Mr. Lopez went on to say that if the settlement were litigated, non-native water users would almost certainly be displaced, the cost of litigation would likely exceed the state's cost share of the project and the Navajo Nation would likely pursue a much earlier priority date than the one laid out in the settlement.

Jim Rogers of the San Juan Agricultural Water Users Association explained that the association has existed since the 1990s and learned some lessons during the Jicarilla water settlement about the value of becoming involved at the beginning of water rights negotiations. However, he said that as the association learned about the settlement and tried to offer input, it was told that it was a closed negotiation. Mr. Rogers said that the association hired ex-State Engineer Tom Turney to assess if enough water exists to be able to carry out the settlement. He said Mr. Turney's assessment was that, on paper, enough water existed, but not in practice. Mr. Rogers went on to note that since Judge Wechsler determined that no need exists for a trial, the only avenue left for non-native irrigators is to appeal the judge's decision. He said that the entire process appears to have been structured not to allow local input, to create conflict and to paint non-native irrigators as trying to deprive their neighbors of water rights, which he resents. Mr. Rogers questioned the methodology used for determining that enough water exists to make the

settlement possible. He also said that no room for compromise ever existed, and that he has lost confidence in the OSE and ISC. Mr. Rogers also said that one of the things that non-native irrigators wanted was the formation of a water bank, which had not been done.

Mr. Lopez responded by saying that the Navajo Nation did not want individual irrigators participating in the negotiations, but that the settlement had been changed to address some of the concerns expressed by groups such as the one that Mr. Rogers represents. He also said that a water bank has been created in the legislation, but has not been utilized yet. Mr. Lopez emphasized that concessions were made for all water users in the settlement.

Questions and comments from the committee included the following:

- the best information available, which is a 2007 Bureau of Reclamation (BOR) survey, suggests that enough water exists to be able to carry out the settlement;
- all seven Colorado River Basin states originally challenged the BOR survey, but the increased scrutiny of the challenges has shown it to be solid;
- while a 600,000 acre-feet diversion of water is a huge amount, the Navajo Irrigation Project (NIP) could divert over 500,000 acre-feet alone under existing law;
- there will likely come a time when the large cities that rely on Colorado River water, such as Phoenix and Los Angeles, will look to the Navajo Nation for water, and while it is possible for the OSE to deny water transfers, the matter will likely end up in court;
- the issue of the razorback sucker fish and the federal Endangered Species Act of 1973 is misleading because New Mexico already delivers more than 700,000 acre-feet of water per year downstream;
- the Navajo Nation negotiated to provide some Colorado River Basin water to Albuquerque in exchange for the NIP, but since the NIP was never completed, the Navajo Nation's position that everyone should have water is coming across as contrary;
- Judge Wechsler ruled there was no need for a trial because the protestants did not present any new evidence on the issues before the court;
- non-native irrigators had every chance to depose and request discovery in the case before Judge Wechsler, but did not do so;
- the Navajo settlement will not become statute, but court decrees are binding law;
- non-native irrigators are unsure if they have rights to some of the storage called for in the settlement; and
- many of the issues raised by opposition to the settlement have been resolved, and most protestants, including the cities of Bloomfield and Aztec and the San Juan Water Commission, dropped their opposition to the settlement.

The committee recessed at 3:30 p.m and went on a tour of a natural gas compression facility.

Friday, August 30

Senator Griego reconvened the meeting to order at 9:15 a.m. The committee approved without objection the minutes for the July meetings of the Drought Subcommittee and the full committee.

Efficient Utilization of Water/Wastewater Infrastructure Funding

Matt Holmes of the New Mexico Rural Water Association (NMRWA) began by providing the committee with a brief overview of the NMRWA, explaining that it lobbies for federal funding in Washington, D.C., and provides on-site technical assistance for rural water systems and operator and manager training. He went on to note that federal and state funding for technical assistance for rural water projects have been steadily declining for the past few years. However, Mr. Holmes also pointed out that the funding needs for drinking water systems are large, totaling more than $1 trillion nationwide over the next 25 years to maintain existing levels of service. He also said that, particularly in New Mexico, drinking water systems are deteriorating at an ever-increasing rate. Mr. Holmes explained that there is increasing concern over the availability and use of federal funds, noting that the Environmental Protection Agency has recommended disallowing and recovering $3 million from the state of expended set-aside drinking water funds, which he characterized as a "shot over the bow". He related a story about a water tank that was funded, installed and never used because of compatibility issues as an example of why federal agencies are scrutinizing the use of federal funds for drinking water projects. Mr. Holmes said that a report called for by House Joint Memorial (HJM) 86, passed during the 2005 session, outlined criteria for water system planning, performance and conservation as a condition for state funding. He said the report suggested setting state standards with clear guidelines, providing technical assistance and training and enforcing regulatory compliance as ways of making sure that federal funds are taken advantage of and used properly. He also said that better planning and design, competent project inspection, prioritized grant funding for true emergencies, education on the upcoming costs of water project financing and simplified funding applications are also missing pieces to the puzzle.

Questions and comments from the committee included:

- the time line and issues associated with the village of Magdalena running out of water earlier in the summer;
- two of the three wells that Magdalena relies on for water were inactive and the third collapsed;
- Magdalena was not especially proactive in managing its situation and waited for the state to intervene;
- water trucks were offered on the day that the third well collapsed, but Magdalena chose to work through the New Mexico Department of Environment (NMED), dragging the issue on for 12 more days;
- Magdalena officials walked away several times from discussions with the OSE regarding reducing or putting its declared rights to beneficial use;
- the difference between technical assistance offered by the NMRWA and legal advice;

- changes made to Water Trust Board (WTB) policies in light of the HJM 86 report have made the process simpler, but misinformation about those changes continues to circulate;
- the single biggest risk to water system investment is deferred maintenance;
- members of the legislature need to have a better understanding of WTB rules to better explain them to their constituents;
- El Valle Water Alliance is a good example of a regionalized water project with managed assets;
- New Mexico could be wasting money by providing capital outlay money to groups without technical assistance or maintenance plans;
- the need to balance funding for small groups that may need water system financing the most against requirements for funding those systems;
- other states have eliminated grant funding in favor of processes that address funding and maintenance;
- enforcement of funding requirements may be more consistent in other states;
- standardized systems that may work in other states may not work in New Mexico;
- some federal money does go through state agencies such as the New Mexico Finance Authority and the United States Department of Agriculture (USDA);
- difficulty in obtaining federal funding has made it unattractive to many smaller water systems;
- the WTB has many requirements for funding, but the USDA has those same requirements, plus many more;
- Ruidoso is under an enforcement order from the NMED for surface water mismanagement;
- many communities chase "free" money to the detriment of their residents, as evidenced by the situation in Magdalena;
- overlap in technical assistance between the NMED and NMRWA;
- Albuquerque and Santa Fe are included in the NMRWA, but some other relatively large cities in New Mexico are not;
- a wide range exists in the amount that water users pay for water, but it is no longer free for anyone;
- the NMED has had more of its budget cut than any other agency;
- the NMED has released a list of other water systems that are in critical condition;
- many small communities cannot stay in compliance with requirements of the Audit Act that are necessary for them to receive capital outlay funds;
- the cost of compliance with WTB rules; and
- a situation in Willard, New Mexico, is an example of the need to deal with wastewater that is now threatening drinking water.

Roca Honda Uranium Mine and Water Use

Senator Griego explained that the Roca Honda uranium mine had recently been sold, and that because the new owners could not be present for the meeting, the committee would hear from the presenters, but would have a more in-depth discussion of the issue at a future meeting.

Governor Gregg P. Shutiva of the Pueblo of Acoma explained that the Pueblo of Acoma is not opposed to mining or development of traditional cultural property such as Mount Taylor, recognizing that some developments can have long-term benefits. However, he said that the proposed Roca Honda uranium mine is not one of those developments, noting that information about the proposed mine suggests that the short-term benefits are outweighed by long-term environmental and economic losses that will flow from the project. Governor Shutiva said that the greatest cost of the project would come from the use of and potential damage to water resources in the area. He noted that there are already limited water resources available in the area and that the proposed mine would compete for them and cause permanent damage to some of those resources. Governor Shutiva also said that contamination from legacy uranium sites upstream on the Rio San Jose has caused health problems for people in his community. He also emphasized the strong spiritual connection the people of Acoma have to land and water, including Mount Taylor. He asked the committee to call for a study of the full impact of uranium mining near Mount Taylor.

Kenneth Tiller, second lieutenant governor for the Pueblo of Laguna, provided the committee with a letter on behalf of Pueblo of Laguna Governor Richard B. Luarkie asking the committee to convene a task force composed of tribal representatives, the NMED and mining companies to address issues related to the proposed mine and associated water use.

Bruce Thomson, director of the water resources program at the University of New Mexico, gave a brief history of uranium mining in New Mexico, noting that historically, New Mexico produced approximately 50% of the United States' domestic production of uranium, and that the state accounts for approximately 38% of the nation's supply. The legacy of uranium mining in New Mexico is troubled, he pointed out, with widespread contamination of soil and water causing major health problems, especially on the lands of the Navajo Nation. In 1979, New Mexico had 38 mines, six mills and nearly 7,000 employees in the uranium mining industry. He strongly recommended that the 1980 San Juan Basin Regional Uranium Study be updated, stressing the need to understand the impacts of uranium mining on the environment, economy and sociocultural values of the state and to research health issues, water quantity and quality impacts and soil and air quality impacts of such mining. He closed by saying that new knowledge and technology can support responsible mining and suggested that an updated study needs to be conducted before New Mexico allows any more large-scale uranium development.

Questions and comments from the committee included the following:

- legacy uranium mines caused huge problems that are difficult for many residents of northwestern New Mexico to forget;
- any studies should include more about water resources than mining;
- many New Mexicans have benefited from uranium mining, but the health effects are also a big problem;
- in situ leaching is now the preferred method of uranium mining, which drills holes and circulates water through formations, presenting fewer health risks to miners;

- in situ mining has been used in southern Texas, but would be more expensive in New Mexico;
- Roca Honda is a new mine, not an existing one;
- there appears to be a limited market for uranium, which raises questions about the point of mining more of it; and
- previous cases showed the impact that a single mine can have on ground water.

There being no further business, the committee adjourned at 12:00 noon.